# SCIENCE

[Entered at the Post-Office of New York, N.Y., as Second-Class Matter.]

A WEEKLY NEWSPAPER OF ALL THE ARTS AND SCIENCES.

SEVENTH YEAR.
VOL. XIV. No. 348.

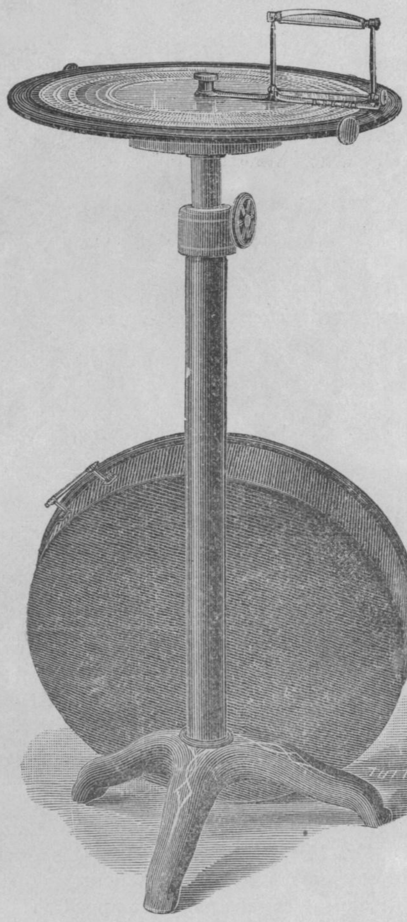
NEW YORK, OCTOBER 4, 1889

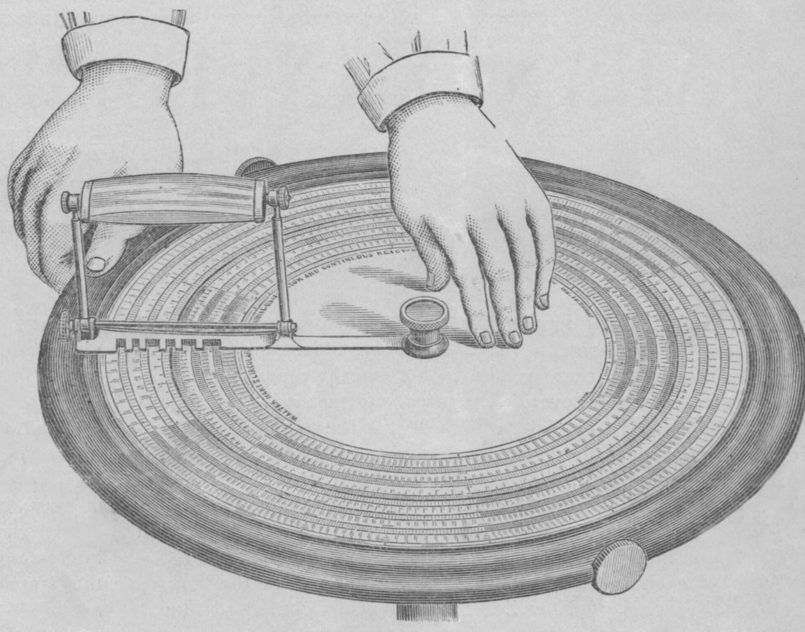
SINGLE COPIES, TEN CENTS.
$3.50 PER YEAR, IN ADVANCE.

## THE PROPORTIOR.

A NOVEL and exceedingly simple form of calculating-machine, called by its inventor a "proportior," is being brought to the attention of accountants, statisticians, and others, in this city. The general appearance of the device is shown by the accompanying engravings. Fig. 1 shows the instrument on its revolving stand, Fig. 2 indicates the first position in solving problems, and Fig. 3 the second position. The magnifier, by which the operator is able to read the divisions of the disk with accuracy, is clearly shown in

Referring to Fig. 1, it will be seen that the outer circle rotates around the inner disk. The relation of the parts is perhaps better shown in Figs. 2 and 3, which are on a larger scale. Stops are provided by which the disk may be fastened to the outer circle at any desired point. The frame that supports the disk and circle is of metal, the disk and ring being of wood, constructed to overcome expansion and contraction, and on which is affixed the scales. The other parts consist of an outer ring, a runner or guide, a cap, two set-screws, and two brakes. The metal frame supports and holds all the other parts. The movements are adjusted to a true centre. The inner disk and the outer ring contain the figures and lines by which computations are made. The runner or guide, which carries the magnifying-glass, is of assistance in locating numbers and lines, and in bringing those on the one scale in line with those on the other, so that results may be quickly obtained and read. The cap acts as a set-screw to the arm, holding it firmly whenever it is required to be so held. The two set-screws on the outside actuate two brakes, which form part of and are located under the outer ring. By them the outer circle is locked or unlocked from the inner disk. When locked, the disk and ring are converted into a table of calculations. The magnifier covers the





FIGS. 1 AND 2.—THE PROPORTIOR.

the two latter figures, the reader being supposed to be looking toward the operator. This calculating-machine, the scale part of which is but fifteen inches in diameter, may be described as a slide rule of greatly extended length, reduced to a small circle. In the language of the inventor, it is a mechanical device which performs with ease, rapidity, and correctness, operations in commercial and mechanical arithmetic. It is further asserted to be an arithmetical library in itself, in which, for the purpose of computation, the unit can be divided into 1,000,000 parts, while the whole numbers range from 1 to 1,000,000.

entire width of both scales, and is an important assistant to the sight in reading the finer divisions. It is mounted upon the runner, and is adjustable.

The operation is as follows. The instrument being set on a suitable surface, and at a convenient height so that the eyes can be directly over it, the caps and set-screws are loosened, so that the runner is free to move and the circle to revolve around the disk. The operator then assumes the position shown in Fig. 2, and exercises just force enough to hold the entire apparatus steady. His right hand grasps the edge of the outer ring, moving it either to or from

him, as may be necessary to bring the recorded figures in line. To assist in this, the runner is used.

It is impossible to give here a full description of the process, but it seems to be little more than finding and aligning certain figures in the two concentric tables. It is claimed by its inventor, Mr. Walter Hart of this city, that with it the simplest as well as the most complicated problems in multiplication, division, proportion, compound proportion, common divisor, common multiple, interest, involution, evolution, compound percentages, averaging of accounts, etc., can be readily solved. He has prepared for distribution a pamphlet giving a full description of the device, and of the method of using it.

## OIL AND IRON IN NEW ZEALAND.

THE New Zealand Government have recently published a report upon the petroleum-deposits of the Taranaki district, which apparently have a great future before them. The oil comes to the surface in many places near New Plymouth, besides impregnating the surrounding country to such an extent that farmers have had to abandon many wells, on account of the petroleum gushing into them with the water. To ascertain whether there was a probability of these oil-deposits proving a mercantile success, the government of New Zealand deputed Mr. Gordon, inspecting engineer of the Mines Department, to visit the locality. Mr. Gordon made a careful survey of the country, and in his lengthy report he affirms that "petroleum exists over a large area, and that it is only a question of boring to the requisite depth to get at the source." According to *Engineering*, these deposits have a twofold advantage: if successfully developed, they not only have at their disposal the Australasian market, now dependent on America for oil, but they would further provide with fuel the local iron industry, at present resting upon limited supplies of coal and charcoal.

Along the shores of the Taranaki district stretch the famous iron-sand beaches of New Zealand, — beaches composed almost entirely of pulverized iron ore. Countless millions of tons of this material lie along the western coasts of the North Island of New Zealand. The ore produces splendid iron, but is somewhat refractory. This would be a trifle, however, if an abundant supply of cheap fuel were available for smelting purposes. This seems to be now forthcoming in the shape of petroleum. For some time past oil has been largely used for smelting in America, and there is no reason why it should not be successfully adopted in New Zealand; the Taranaki oil having plenty of body, and being admirably adapted for fuel purposes. It may be noted, that, while the oil-deposits of America and Russia are several hundred miles inland, those of New Zealand are actually on the coast; so close, indeed, that the beach at New Plymouth is pitted with petroleum oozings. What is now wanted is some trial drills to test the quantity and character of the oil-supply. A few drills in the vicinity of New Plymouth ought to bring to the surface not only enough oil to provide the locality with smelting fuel, but also sufficient for several refineries.

It is curious, that, while millions are invested by the public of this country in purely speculative gold-mines, hardly any funds are devoted to sinking wells for petroleum in Burmah, Canada, and New Zealand. In America, hundreds of times over, a single well has proved as remunerative as a gold-mine; yet, although petroleum can be easily enough turned into gold, such is the demand for it, English investors have hitherto ignored petroleum undertakings. Presently they will rush into it, just as shippers have rushed into the oil-steamer business, building sixty tank-vessels in less than five years, after a prolonged period of similar indifference.

## THE ORIGIN OF PETROLEUM.[1]

THE enormous consumption of petroleum and natural gas frequently raises the question as to the probability of the proximate exhaustion of the supply; and, without doubt, many fear to adopt the use of oil, from a feeling that if such use once becomes general, the demand will exceed the production, the price will rise indefinitely, and old methods of illumination and old forms of fuel will have to be reverted to. From this point of view, it is most interesting to inquire what are the probabilities of a continuous supply; and such an investigation leads at once to the question, "What is the origin of petroleum?" In the year 1877, Professor Mendeleeff undertook to answer this question; and as his theory appears to be very little known, and has never been fully set forth in the English language, I trust you will forgive me for laying a matter so interesting before you. Dr. Mendeleeff commences his essay by the statement that most persons assume, without any special reason, — excepting, perhaps, its chemical composition, — that naphtha, like coal, has a vegetable origin. He combats this hypothesis, and points out, in the first place, that naphtha must have been formed in the depths of the earth. It could not have been produced on the surface, because it would have evaporated; nor over a sea-bottom, because it would have floated up and been dissipated by the same means. In the next place, he shows that naphtha must have been formed beneath the very site on which it is found; that it could not have come from a distance, like so many other geological deposits, and for the reasons given above, namely, that it could not be water-borne, and could not have flowed along

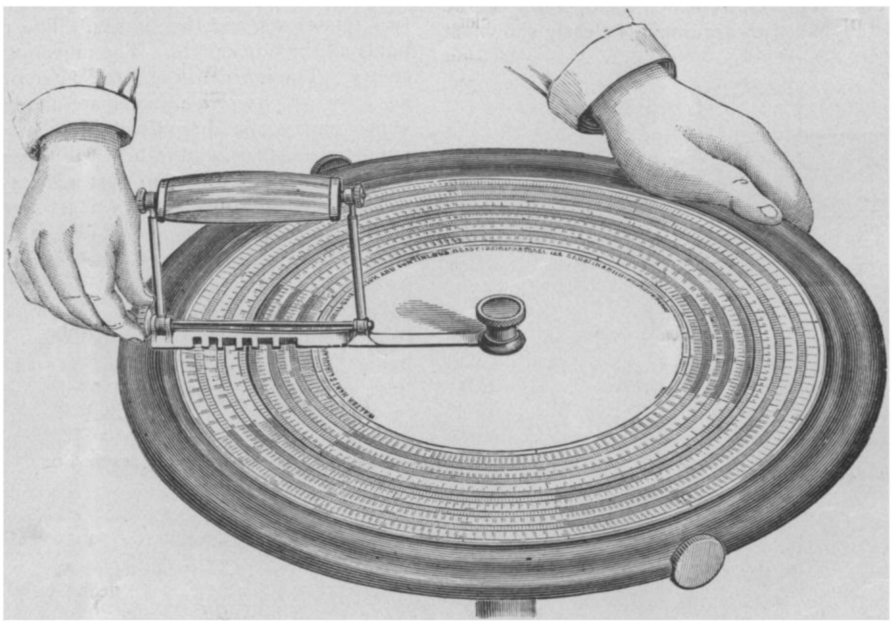


FIG. 3. — THE PROPORTIOR.

[1] Extracted from Mr. Anderson's presidential address to Section G (Mechanical Science) of the British Association.